Research on Hybrid Teaching Pattern Design in Applied Colleges and Universities Under the Background of Big Data

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Abstract. This study aims at the problems in the theoretical research and teaching practice of Hybrid Teaching Based on BP neural network. In the aspect of theoretical research, it combs the research status of blended teaching at home and abroad. Combined with practical teaching experience, this paper constructs a hybrid teaching mode based on intelligent teaching platform, and optimizes classroom teaching design from five aspects: learning task list, teaching resources, teaching activities, teaching evaluation and teaching strategies. Teaching experiment research in teaching practice. And the teaching experiment was carried out.

Keywords: BP neural network · Applied University · Mixed teaching mode

1 Introduction

With the reform of education and teaching mode and the network of modern university education, a new education and learning mode MOOC has emerged. Using new technology and platform, MOOCS puts forward a new learning method and using system. The system includes a variety of learning resources, such as exercises, discussion topics, supplementary assignments, short videos and after-school tests. At the same time, it adopts a new teaching strategy and method, which combines "online learning", "flipped learning" and "mutual learning". 2. Students do not need to study at a fixed time and place, but can use the little time in their life to learn through online counseling and interaction, It strengthens the discussion and exchange between teachers and students, and organizes the teaching resources more reasonably, so that students can learn step by step according to the plan. However, teachers and students in MOOCS can not communicate face to face like in traditional class, which is not conducive to effective communication between teachers and students [1]. Therefore, at present, the traditional classroom teaching can not be completely replaced by MOOCS classroom. We can adopt a hybrid teaching mode, combining MOOCS and traditional classroom teaching methods, so that they can show their strengths in teaching.

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M. A. Jan and F. Khan (Eds.): BigIoT-EDU 2021, LNICST 392, pp. 278–284, 2021.
https://doi.org/10.1007/978-3-030-87903-7_35

2 Related Concepts and Theoretical Basis

2.1 Definition of Related Concepts

2.1.1 Blended Teaching

Blended teaching combines the advantages of online teaching and face-to-face teaching, and has become one of the effective carriers for the deep integration of information technology and education. According to the literature review, the difference between blended teaching and blended learning is very small, so many studies do not distinguish the two, and the two can be mixed. Due to the continuous innovation of the supporting environment of blended teaching and the deepening of the theoretical research of blended teaching, scholars at home and abroad have given the concept of blended teaching from different angles, but there is no unified definition.

$$Y = Y_{\mathrm{f}^{-1}} modn \tag{1}$$

$$key_1 = Y^a = g^{ba} modn \tag{2}$$

$$r_a = (Y_2) aQ^{-1} modn \tag{3}$$

He Kekang, Li Kedong and Li Jiahou, the famous scholars in China, have given the concept of blended learning. Professor he Kekang believes that blended learning inherits the dual advantages of traditional learning and online learning, which not only plays the leading role of teachers' guidance and supervision, but also plays the main role of students' autonomous learning. Professor Li Kedong believes that blended learning is a teaching method that integrates face-to-face teaching and online learning to reduce costs and improve efficiency. Li Jiahou believes that blended learning is to select the appropriate part from many teaching factors to complete the teaching objectives. Foreign scholars Singh & reed believe that blended learning is a learning way to achieve the optimal learning effect through the combination of "appropriate" learners, time, learning technology and learning style.

2.1.2 Flipped Classroom

"Flipped classroom" is translated from "the FD classroom", which is a new teaching mode and a "reversal" of the traditional classroom. In the traditional classroom, the mastery of knowledge depends on Teachers' teaching in the classroom, while in the flipped classroom, the mastery of knowledge depends on students' autonomous learning before class. In the traditional classroom, the internalization of knowledge relies on homework exercises after class, while in the flipped classroom, the internalization of knowledge relies on the teaching activities such as question answering and discussion, group exploration and achievement display organized by teachers in the classroom. Professor Zhang Jinlei believes that flipped classroom is the reverse arrangement of knowledge teaching and knowledge internalization, changing the role of teachers and students in traditional teaching, and re planning the classroom time. Flipped classroom teaching mode emphasizes students' autonomous learning and inquiry learning. Learners

can choose their favorite learning methods to complete the learning of new knowledge. Classroom time is reserved for teaching activities such as question answering and inquiry.

Flipped classroom is a new paradigm of teaching reform [2]. Flipped classroom emphasizes mastering basic knowledge through preview before class and completing knowledge internalization in class. Hybrid teaching emphasizes the combination of online and offline, and the hybrid online and offline teaching platform can be used before, during and after class.

2.1.3 Intelligent Teaching Platform

Professor Zhu zhiting pointed out that by building an ecological learning environment with technology integration, smart education, based on the principle of "accuracy, optimization, thinking, sharing and creation", enables teachers to carry out effective teaching and learners to obtain personalized learning services with good experience, In order to cultivate talents with good thinking quality and strong innovation ability, intelligent teaching platform makes teaching activity monitoring, data acquisition and analysis convenient and efficient, provides decision support for the implementation of precision teaching, optimizes the teaching process, realizes personalized teaching, improves students' thinking quality and cultivates innovation ability. The "precision" here mainly involves the accurate determination of whether the learning occurs and whether the learning task is completed on schedule, and providing accurate assistance for learners through data analysis. Intelligent teaching platform can realize individual learning, efficient learning, immersion learning and continuous learning, which provides material basis for the realization of intelligent education.

2.2 Relevant Theoretical Basis

Constructivism theory proposes that the main goal of learning is "meaning construction", and the basis of learning is "situation", "communication" and "cooperation". The situation establishes the link between the new and old knowledge and experience, and the learning of "meaning construction" takes place in the specific problem situation. Therefore, the design teaching should first design the problem situation suitable for students' learning. "Meaning construction" is accomplished by students' autonomous learning, "cooperation" and "communication." cooperation "means group cooperation and exploration," communication "means teaching interaction, including teacher-student and student student interaction.

The Enlightenment of constructivism theory to this study: constructivism emphasizes the autonomy of learning and the self construction of knowledge. The design of learning task list in this study fully reflects the dominant position of students' learning. The intelligent teaching platform has rich teaching resources and creates a good learning "situation". Group assignments/tasks need to be completed through group "cooperation", Discussion and question answering, and achievement presentation embody "communication".

3 The Construction of Teaching Mode

3.1 Analysis of Typical Teaching Mode

In teaching practice, many researchers put forward different hybrid teaching models, such as the hybrid teaching model based on umu interactive learning platform, and the hybrid teaching model based on wechat platform, superstar learning, two classroom and other intelligent teaching platforms. These hybrid teaching models are relatively simple, and the theoretical height is not enough.

Some well-known scholars at home and abroad also put forward the mixed teaching mode, which is of universal significance. The following is a list of three representative scholars' mixed teaching mode.

Cohen, an American scholar, analyzes the system as a whole and puts forward the octagonal framework to explain the system well. As shown in Fig. 1, in the octagonal framework, hybrid teaching can be divided into eight dimensions: teaching, organization, technology, interface design, evaluation, management, resources and ethics. These eight dimensions are interdependent and work together to improve the teaching effect by optimizing the online and offline teaching structure. Among them, teaching and evaluation mainly refers to teaching objectives, contents, platforms, methods and strategies; organization and management mainly refers to the management of digital learning and the maintenance of learning environment; technology and interface design mainly refers to the provision of software and hardware technology and good user experience; resources and ethics mainly refer to open teaching resources and equal and friendly learning atmosphere.

3.2 Improvement After Class

Students are required to complete exercises online to consolidate their knowledge in time; on the other hand, to carry out professional experience. Around the key and difficult points of this chapter, the teacher designed a social service activity of "going into the community, health guidance – paying attention to diabetes". The whole activity takes students as the main body. Students are required to prepare propaganda posters and PPT in advance, and carry out blood glucose and blood pressure detection on site [3]. The setting of this link, the combination of work and study, and the unity of knowledge and practice, has greatly stimulated the students' learning enthusiasm, cultivated the students' ability to analyze and solve the problems, and this kind of feeling obtained through personal practice is easier to be deeply rooted in the depth of the students' hearts, never forget, and promote the spirit of China, The comprehensive evaluation method which combines the usual performance, practical training performance and examination results is implemented. While examining the systematicness, integrity and scientificity of students' knowledge, we should focus on examining students' knowledge application ability and operation skills, so as to avoid the phenomenon of "high score but low ability". Diversified curriculum evaluation methods can timely reflect the learning situation of students, provide useful feedback to students, help students build self-confidence, stimulate and cultivate their interest in learning.

4 Sakai Based E-learning Space

4.1 Analysis of Saka Concept

Saka is a free, open source online collaboration and learning environment, developed and maintained by Saka members. It was initiated by Indiana University, University of Michigan, Stanford University and Massachusetts Institute of technology in 2004 as an open source curriculum and teaching management system (CMS) development program, mainly to replace the system or related business software system independently developed by each university. Sakai's collaboration and learning environment is a free educational software platform with shared source code, which is mainly used for teaching, research and collaboration. Network learning space is the basic learning space for teachers and students based on the network environment. It is the product of the deep integration of information technology and education and teaching. As shown in Fig. 1. It breaks through the limitations of I space, teaching methods and teaching resources of traditional teaching mode, so that students can make full use of their spare time to learn, It promotes the learning and communication between teachers and students, teachers and teachers, students and students. It can not only improve teachers' teaching level, but also improve students' self-learning ability.

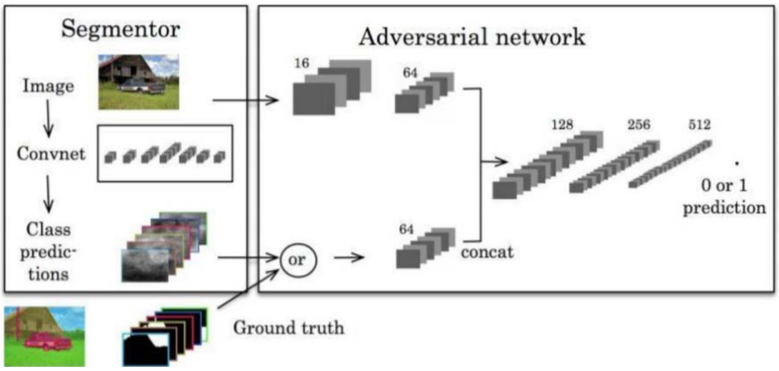

Fig. 1. Analysis of Saka concept

4.2 The Current Situation of Usage and Popularization in China

At present, Sakai has been introduced into many universities in China, such as Shanghai Fudan University and Beijing University of Posts and telecommunications. Under the guidance of the Provincial Department of education, Sakai's research and development has achieved rapid development. Now more than 30 universities have used Saka based online learning space. The Saka based e-learning space platform is designed with Java as the development language, mysq as the database, Tomcat as the background server, and VMware virtualization as the deployment environment. Four virtualization servers are deployed on two physical servers, two web application servers for network teaching,

one mysq database server for network teaching data storage, and one od middleware server for data storage and load balancing.

5 The Design of Three Mixed Teaching Mode

Sakai based online teaching process learning platform includes five roles: system administrator, educational administrator, College (Department) supervisor, teacher and student.. The system administrator mainly includes four modules: system management, course statistics, course evaluation management, course construction and application statistics management. Among them, the system management module mainly includes four sub modules: user management, role management, module management and log management; the course statistics module mainly includes four sub modules: School macro data statistics, current semester data statistics, teacher data statistics and course basic item statistics; the course evaluation management module mainly includes two sub modules: evaluation rule setting and evaluation result inquiry; The module of curriculum construction and application mainly includes two sub modules: Statistics of overall curriculum construction and statistics of teachers' curriculum construction [4]. College (Department) supervisor mainly includes three modules: course statistics inquiry, course evaluation inquiry, course construction and Application Statistics. Among them, the course statistics module mainly includes three sub modules: the current semester data statistics of the Department, the data statistics of the beginning teachers and the statistics of the basic items of the course; the course evaluation module mainly includes the result inquiry sub module of the course evaluation of the Department; The course construction and Application Statistics module mainly includes two sub modules: the overall course construction statistics of the Department and the teachers' course construction statistics. Teacher users mainly include curriculum construction, curriculum management, curriculum resource construction, online interactive communication, homework and test release and correction, student performance management, curriculum construction and application query, student learning statistics query and other modules.

6 Concluding Remarks

As an application-oriented university, it is our duty to cultivate high-quality application-oriented talents and serve the development of economy and society. Curriculum teaching is the foundation to achieve the goal of cultivating high-quality applied talents. Therefore, in the final analysis, the realization of talent training goal is the reform and improvement of curriculum and curriculum system. The construction of network learning space provides an open and free network learning environment for teachers and students, makes full use of information technology teaching means and network teaching platform, and improves the teaching effect and the quality of personnel training. The hybrid teaching mode, which combines classroom teaching and network teaching platform, will become the mainstream direction of teaching mode reform in the future.

Acknowledgements. Heilongjiang Province higher education teaching reform research project name: mobile Internet era applied colleges and universities mixed teaching model reform research, number: SJGY20190457.

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